

Appl. No. 10/017,089  
Request for Reconsideration dated March 17, 2004  
Reply to Office Action of January 28, 2004

REMARKS

Reconsideration of the final rejection of the claims of the captioned application is respectfully requested in view of the foregoing amendments and the following remarks.

Initially, Applicant's attorney wishes to thank Examiners Flores Ruiz and Ip for their courtesy in granting a recent interview during which the Examiners objection to the form of the claims and the distinctions over the prior art were discussed.

At the interview, Applicant's attorney produced for the Examiners a series of illustrations of the reflective surfaces of various geometric forms including the circular section of a parabolic rotational body which is the subject matter of the present invention. A mirror with a reflective surface in the form of a parabolic cylinder is quite different from that of the present invention as is clearly illustrated in the diagrammatic representations. It is requested that the collection of illustrations be appended to this response.

As discussed, it is important to distinguish between a parabolic rotational body, a rotational paraboloid and a parabolic cylinder. These different geometrical forms are defined as follows:

A parabolic rotational body is produced by rotation of a parabola around an arbitrary axis of rotation. A parabolic rotational body mirror generally produces on its axis of rotation a line focus if the axis of symmetry of the parabola and the axis of rotation do not coincide.

A rotational paraboloid constitutes a special parabolic rotational body in which the axis of rotation coincides with the axis of symmetry of the parabola. A rotational paraboloid mirror produces on its axis of rotation a point focus.

A parabolic cylinder mirror is not produced by rotation of a parabola around an arbitrary or special axis of rotation; it is produced by translation of the parabola in direction of a cylinder axis. The cylinder axis is oriented perpendicular to the axis of symmetry of the parabola

Although Anikitchev discloses a coaxial laser resonator which outputs a beam passing through an optical system to reform the circular sector shaped laser beam into a rectangular shaped laser beam; his system uses a mirror with a reflective surface in the form of a parabolic cylinder which is not a parabolic rotational body. Anikitchev uses a conical sector mirror in Figure 1, Item 20 to shape the azimuthal direction of the laser beam, and a parabolic cylinder mirror identified by the numeral 24 to shape the radial direction of the laser beam. His parabolic cylinder mirror does not shape the laser beam in two different directions (azimuthal and radial) and Anikitchev does not so suggest.

With only the parabolic cylinder mirror, the circular sector shaped laser beam cannot be reformed into a rectangular laser beam because only in one direction does the parabolic cylinder mirror have a curved reflective surface. In the other direction, the parabolic cylinder mirror acts as a flat, non-curved mirror. Accordingly, the parabolic cylinder mirror, a laser beam can be reformed only in one direction, not in two different directions.

In contrast to the Anikitchev mirror, the reflective surface in the form of a circular sector of a parabolic rotational body reforms the laser beam both in the azimuthal direction and in the radial direction and as disclosed in the present invention.

Moreover, it should be noted that Anikitchev discloses a resonator mirror (Item 8 in Figure 1) which is designed as a rotational paraboloid in order to effectively couple all areas of the laser resonator (see Column 2, lines 36-39). However, this provides no suggestion to a person having ordinary skill in the art at the time the present invention was made to use a rotational paraboloid as a beam reforming mirror. The claims of the present invention are clearly directed to such a beam reforming system in combination with a coaxial laser resonator generating an azimuthal polarization so as to produce a linear polarization.

As suggested by Examiner Ip, the independent claims have been substantially revised to make clear that there are two major components to the assembly, one being the coaxial laser beam resonator and the second being the beam reforming system, and the beam reforming system includes the specifically configured mirror as a component thereof. The functional language does not interfere with the clarity of the structural combination.

In view of the foregoing amendments and remarks, it is respectfully submitted that the amended claims clearly define a novel and unobvious coaxial laser assembly to produce a linearly polarized beam which can be further modified if so desired.

In the event that the Examiners do not believe that the amended claims are allowable, it is respectfully requested that the amended claims be entered for purposes of appeal.

Respectfully submitted,

JOACHIM SCHULZ ET AL

By 

Peter L. Costas  
Attorney for Applicants  
Registration No. 18,637  
(860) 241-2630